

REMARKS

The Office Action dated June 1, 2010, has been received and carefully reviewed. The preceding amendments and the following remarks form a full and complete response thereto.

Claims 1-17 and 34-48 were previously withdrawn. Claim 22 has been canceled without prejudice or disclaimer. Claims 18-20, 23-28, 33, 49-51 and 53-55 have been amended. New claims 56 and 57 have been added. The Specification has been amended. Support for claim amendments, new claims and amendments to the Specification can be found, for example, in the as-filed Specification at Figs. 1-4 and page 13, line 1-page 14, line 23. No new matter has been added. Accordingly, claims 18-21, 23-33 and 49-57 are pending and are submitted for consideration.

Objections to the Claims

The Office objected to claim 18 for allegedly missing an “and.” To address the Office’s objection, claim 18 has been amended to recite “and” between the recited “light source” and “catalytic target structure” features of claim 18. As result, Applicants respectfully request withdrawal of the objection to claim 18.

Claim Rejections under 35 U.S.C. § 112

Claims 22-24 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. Claims 21-24 have been amended to delete the recitation of

“approximately 50%” and to consistently refer to perforations, openings and open areas as “holes.” Accordingly, each of the bases for the indefiniteness rejections have been addressed. Applicants respectfully submit that the amended claims are definite and request reconsideration and withdrawal of the rejections.

Claim Rejections under 35 U.S.C. § 103

Claims 18-24 and 28-33

Claims 18-24 and 28-33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,238,631 to Ogata *et al.* (“Ogata”) in view of U.S. Patent No. 6,315,963 to Speer (“Speer”) and further in view of International Patent Application Publication No. WO 02/102497 to Kim (“Kim”) and further in view of U.S. Patent No. 5,933,702 to Goswami (“Goswami”). Applicants respectfully traverse the rejections and submit that claims 18-24 and 28-33 are patentable over the cited references.

The rejection of claim 18 is improper because the cited references, alone or in combination, fail to teach or suggest each and every feature of claim 18. For example, none of the cited references teaches or suggests:

a one-piece catalytic target structure ... including:
a surface ... having a repeating V-shaped geometry comprising a plurality of V-shaped pleatings that generally surround a circumference of the ultraviolet light source, the plurality of V-shaped pleatings including:
(i) apexes formed by panels of the catalytic target structure that converge to point away from the ultraviolet light source and (ii) tips formed by panels of the catalytic target structure that converge to point towards the ultraviolet light energy source; and

a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings;

as recited in amended claim 18. (emphasis added).

Ogata discloses “[a] porous filter plate for [a] three-dimensional, photocatalytic filter apparatus.” Ogata at col. 5, lines 13-18. Each filter plate 2 of the photocatalytic filter apparatus of Ogata has a porous substrate 20 having “a lot of pores 21 through which a fluid ... containing pollutants passes.” *Id.* at col. 5, lines 20-22. Ogata further discloses an embodiment of a photocatalytic filter apparatus “having a plurality of porous filter plates 2i arranged around a light source 4[,] spirally extending along the axis of the light source,” and “contained in a cylindrical pipe.” *Id.* at Fig. 8 and col. 8, line 66-col. 9, line 4.

However, as admitted by the Office, Ogata does not “provi[de] porous filter plates shown in the form of a pleat around the UV light source.” Office Action at p. 4. Accordingly, Ogata does not teach or suggest that the plurality of porous filter plates 2i have “repeating V-shaped geometry comprising a plurality of V-shaped pleatings” that include: “**(i) apexes** formed by panels of the catalytic target structure that converge to point **away** from the ultraviolet light source and **(ii) tips** formed by panels of the catalytic target structure that converge and point **towards** the ultraviolet light energy source,” as recited in amended claim 18. (emphasis added). Instead, the plurality of porous filter plates 2i of Ogata form a spiral extending along the axis of light source 4 and extending radially away from the light source 4. None of the plurality of porous filter plates 2i of Ogata converge to form an apex pointing **away** from light source 4.

In addition, Ogata merely discloses that there are “a lot of pores 21” in porous substrate 20 of the porous filter plates. Ogata at col. 5, lines 20-22. Ogata teaches or suggests absolutely nothing about the **arrangement** of the pores 21. Accordingly, Ogata also fails to teach or suggest “**a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels** that form the apexes and the tips of the plurality of V-shaped pleatings,” as recited in amended claim 18. (emphasis added).

Speer is directed to a photocatalytic reaction enhancement device 10 installed within a UV reaction chamber 12 that houses a UV source 14. Speer at col. 6, lines 32-36. Speer discloses that the photocatalytic reaction enhancement device 10 includes a substrate 16 “folded in accordion-like fashion to form a plurality of panels 18 connected in series.” *Id.* at col. 7, lines 36-40. However, none of the panels 18 of the photocatalytic reaction enhancement device 10 of Speer converge to point **towards** UV source 14. Accordingly, like Ogata, Speer does not teach or suggest that the photocatalytic reaction enhancement device 10 has “repeating V-shaped geometry comprising a plurality of V-shaped pleatings” that include: “**(i) apexes** formed by panels of the catalytic target structure that converge to point **away** from the ultraviolet light source and **(ii) tips** formed by panels of the catalytic target structure that converge and point **towards** the ultraviolet light energy source,” as recited in amended claim 18. (emphasis added). In addition, like Ogata, Speer fails to teach or suggest “**a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels** that form the apexes and the tips of the plurality of V-shaped pleatings,” as recited in amended claim 18. (emphasis added).

Kim is directed to an illumination apparatus for air purification using a photocatalyst. A photocatalyst is applied on an external surface of transparent member 63 for a photochemical reaction when radiated with ultraviolet rays radiated from ultraviolet ray source 61. Ultraviolet ray source 61 is mounted between a pair of supports 73, and both ends of transparent member 63 are supported by supports 73. *See Kim at Fig. 5 and page 7, line 29-page 8, line 1.* Kim is relied on for its disclosure of supports 73. *See Office Action at p. 5.* Nothing in Kim could reasonably be understood as teaching or suggesting the “repeating V-shaped geometry comprising a plurality of V-shaped pleatings” or “plurality of holes” features of amended claim 18.

Goswami is directed to a system for air disinfection by photocatalytic oxidation. The system may include circular catalytic inserts 212 having a pleated surface 251 illuminated from the interior by UV lamp 224. *See Goswami at Fig. 20 and col. 11, lines 30-35.* Like Ogata, Speer and Kim, nothing in Goswami could be reasonably understood as teaching or suggesting **“a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels** that form the apexes and the tips of the plurality of V-shaped pleatings,” as recited in amended claim 18. (emphasis added).

As none of the cited references teach or suggest:

a one-piece catalytic target structure ... including:

a surface ... having a repeating V-shaped geometry comprising a plurality of V-shaped pleatings that generally surround a circumference of the ultraviolet light source, the plurality of V-shaped pleatings including: (i) apexes formed by panels of the catalytic target structure that converge to point away from the ultraviolet light source and (ii) tips formed by panels of the catalytic target structure that converge to point towards the ultraviolet light energy source; and

a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings;

as recited in amended claim 18, and the rejection of claim 18 is improper. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection.

Claims 19-24 and 28-33 are dependent, directly or indirectly, on independent claim 18 and are patentable over the cited references for the same reasons discussed above in regard to claim 18 as well as for the additional limitations they recite.

Claims 25-27

Claims 25-27 are rejected over under 35 U.S.C. § 103(a) as being unpatentable over Ogata in view of Speer and further in view of Kim and further in view of Goswami and further in view of U.S. Patent No. 6,063,343 to Say *et al.* ("Say") and further in view of U.S. Patent No. 6,053,968 to Miller ("Miller"). Applicants respectfully traverse the rejections and submit that claims 25-27 are patentable over the cited references.

Say is directed to a reactor that conducts photocatalytic conversion of contaminants in a fluid stream. The reactor may have a support fixture for the photocatalyst reaction that is a formed block 638 having one or more cylindrically shaped cavities 640 defined by a surface with one or more pleats 636 in approximately a star-shaped configuration. A light source 104 may be provided within cavity 640 so as to illuminate the entire surface of the pleats 636. The reactor may have sensors attached to indicators to warn a user when some or all of light sources become non-operational. *See Say* at Fig. 11; col. 7, line 54-col. 8, line 11; and col. 10, lines 14-18.

Miller is directed to portable room air filter having a UV light status indicator 78. UV light status indicator 78 is a fiber optic cable that extends into interior chamber 22 and is optically shielded to prevent direct exposure to UV light. *See* Miller at Fig. 1 and col. 5, lines 41-46.

Claims 25-27 are dependent, directly or indirectly, on independent claim 18. Say and Miller fail to teach or suggest “a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings,” as recited in amended claim 18. Therefore, Say and Miller fail to remedy the deficiencies of the combination of Ogata, Speer, Kim and Goswami set forth above in regard to claim 18. Accordingly, claims 25-27 are patentable over the cited references for the same reasons discussed above in regard to claim 18 as well as for the additional limitations they recite. Applicants respectfully request reconsideration and withdrawal of the rejections.

Claims 49-52

Claims 49-52 are rejected over under 35 U.S.C. § 103(a) as being unpatentable over Ogata in view of Speer and further in view of Kim and further in view of Goswami and further in view of Say and further in view of Miller. Applicants respectfully traverse the rejections and submit that claims 49-52 are patentable over the cited references.

The rejection of claim 49 is improper because the cited references, alone or in combination, fail to teach or suggest each and every feature of claim 49. For example, for

reasons explained above in regard to claims 18 and 25-27, none of the cited references teaches or suggests:

at least one single layer catalytic target structure ... having a repeating V-shaped geometry comprising a plurality of V-shaped pleatings that generally surround a circumference of the ultraviolet light source, the plurality of V-shaped pleatings including: (i) apexes formed by panels of the catalytic target structure that converge to point away from the ultraviolet light source and (ii) tips formed by panels of the catalytic target structure that converge and point towards the ultraviolet light energy source; and

a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings;

as recited in amended claim 49. (emphasis added).

Accordingly, Applicants respectfully submit that the rejection of claim 49 is improper and respectfully request reconsideration and withdrawal of the rejection

Claims 50-52 are dependent on independent claim 49 and are patentable over the cited references for the same reasons discussed above in regard to claim 49 as well as for the additional limitations they recite.

Claims 53-55

Claims 53-55 are rejected over under 35 U.S.C. § 103(a) as being unpatentable over Ogata in view of Speer and further in view of Kim and further in view of Goswami and further in view of Say and further in view of Miller and further in view of U.S. Patent No. 6,972,415 to Schaible *et al.* ("Schaible").

Schaible is directed to a fluid treatment system 20 with a UV emitter 30, UV sensor 46 and intelligent driver 40. UV sensor 46 measures UV light emitted by UV emitter 40 and transmits the UV data to intelligent driver 40. Based on the UV data, intelligent driver 40 adjusts

the power supplied to UV emitter 40 and/or generates an alarm. *See* Schaible at Fig. 1; col. 6, lines 42-65; and col. 7, lines 33-41.

Claims 53-55 are dependent, directly or indirectly, on independent claim 49. Schaible fails to teach or suggest “a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings,” as recited in amended claim 49. Therefore, Schaible fails to remedy the deficiencies of the combination of Ogata, Speer, Kim, Goswami, Say and Miller set forth above in regard to claim 49. Accordingly, claims 53-55 are patentable over the cited references for the same reasons discussed above in regard to claim 49 as well as for the additional limitations they recite. Applicants respectfully request reconsideration and withdrawal of the rejections.

New Claims 56 and 57

Claims 56 and 57 are dependent on independent claims 18 and 49, respectively, and are patentable over the cited references for the same reasons discussed above in regard to claims 18 and 49. In addition, claims 56 and 57 are patentable over the cited references because none of the cited references, alone or in combination, teaches or suggests that “a plurality of the plurality of holes are arranged in rows that extend along each of the apexes formed by the panels of the catalytic target structure,” as recited in new claims 56 and 57. Accordingly, claims 56 and 57 are patentable over the cited references for this additional, independent reason.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed. Applicants therefore respectfully request that the Office reconsider all presently outstanding objections and rejections, and that they be withdrawn. Applicants submit that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

The Applicants respectfully petitioned for a one-month extension of time. Any fees for the extension together with any additional fees may be charged to Counsel's Deposit Account No. 02 2135.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

RESPECTFULLY SUBMITTED,					
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